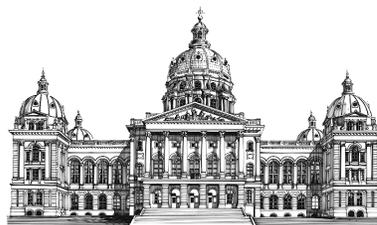

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State Capitol
Des Moines, IA 50319
September 30, 1999

Johne's Disease

ISSUE

This **Issue Review** examines the causes, symptoms, and cost of Johne's Disease to cattle and dairy producers and herd testing programs in other states.

AFFECTED AGENCIES

Department of Agriculture and Land Stewardship

BACKGROUND

Johne's (pronounced "Yo-nees") Disease is a contagious disease of the intestinal track of ruminants caused by the bacteria *Mycobacterium paratuberculosis* or *M. paratuberculosis*. Ruminants are hooved animals that have a multi-chambered stomach and chew a cud such as cattle, sheep, goats, llamas, deer, and elk. Symptoms of Johne's Disease include diarrhea, rapid weight loss, reduced milk production, and eventually death.

Johne's is a slow progressive disease and older animals tend to be resistant to it. As Johne's Disease progresses *M. paratuberculosis* bacteria is shed in the manure and can survive for over one year in the open environment due to its resistance to heat, cold, and dry conditions. Johne's Disease is typically spread by the consumption of feed or water contaminated by manure from infected animals. Another source of infection is milk produced by infected females or the outside of teats contaminated with infected manure.

Current tests for Johne's Disease, such as fecal cultures or blood antibody tests such as enzyme linked immunosorbent assay (ELISA), do not detect the disease until it has progressed into later stages. Fecal cultures, which cost around \$10 to \$20 per animal, can detect Johne's in animals shedding the bacteria in their manure. Blood antibody tests, like ELISA, which cost approximately \$5 per animal, are effective in determining the presence of the disease in animals over two to three years of age prior to the advanced stages of the disease. There is no effective test to determine the presence of Johne's Disease in cattle less than two to three years of age.

There are four stages of Johne's Disease. Stage I is characterized by no symptoms with the disease occurring in calves and heifers less than two years old or with animals exposed to a small amount of bacteria. In Stage II, animals appear healthy and there is enough shedding of the bacteria for detection in fecal cultures. At Stage III animals have occasional diarrhea,

weight loss, and decreased milk production. Stage IV indicates advanced disease with diarrhea and thin animals.

The literature on Johne's Disease discusses what is known as "the iceberg phenomenon" which states that for every animal at Stage IV in a cattle herd it can be expected that one or two animals are at Stage III, six to eight animals are at Stage II, and 10 to 15 animals are at Stage I. In other words, for every animal obviously infected there are 15 to 25 animals that are likely infected.

Currently there is no treatment for Johne's Disease and proper management is essential for prevention. Young and newborn calves must be kept separate from infected adult cattle, have no contact with manure from infected adult cattle, and be fed milk free of *M. paratuberculosis* bacteria. Adult cattle must be tested for the disease and infected animals removed. Replacement cattle should come from herds tested and determined to be free of Johne's Disease.

The bacteria responsible for Johne's Disease, *M. paratuberculosis*, has been found in a few humans with Crohn's disease, a chronic intestinal disease. Since there has been contradictory results from studies investigating the role of *M. paratuberculosis* in Crohn's disease, uncertainty exists about public health from cattle infected with Johne's Disease. United States Department of Agriculture (USDA) research has shown commercial pasteurization inactivates *M. paratuberculosis* in milk, but public health concerns remain for undercooked meat and unpasteurized milk products.

CURRENT SITUATION

The National Animal Health Monitoring System Dairy 1996 Study, by the USDA, found that in herds where at least 10.0% of the cull cows showed symptoms of Johne's Disease, the average cost to the producer was \$227 per cow, per year. Most of this loss was due to reduced milk production. The same Study found, using blood tests and clinical history to identify herds where at least 10.0% of the cows were infected, an estimated 22.0% of the United States dairy herds are infected with Johne's Disease.

HERD TESTING PROGRAMS

Illinois, Ohio, and Wisconsin have voluntary cattle herd testing programs in place. Similar aspects of these herd testing programs include assigning herd level status depending on the number of times the herd or a statistical subset of the herd (at least 30 head) tested negative for Johne's Disease. The greater the herd status level the more times the herd tested negative and the more confidence a potential buyer would have in purchasing cattle from the herd.

The Illinois' Voluntary Johne's Disease Certification Program is comprised of a Standard Track Program and a Fast Track Program. Under the Standard Track Program herds are enrolled at Level 1 when 30 cattle test negative with the ELISA blood test. The herd advances to Level 2 when 30 cattle or the complete herd tests negative with the ELISA test. Level 3 occurs when 30 cattle test negative to fecal culture tests and Level 4 is obtained upon another negative ELISA test on 30 cattle. The herd must test negative under the ELISA test every 10 to 14 months to maintain Level 4 status. Under the Fast Track Program a herd owner can be listed at Level 2 when the owner and a veterinarian state there has been no history of Johne's Disease in the herd for the past five years and 30 cattle tested negative for the disease with the ELISA test. The time interval for herd testing for level advancement is 10 to 14 months. Under this program herd testing is not paid by the State.

Under the Ohio Johne's Test Negative Status Herd Program all cattle over two years of age are tested yearly and all new herd animals must have a negative Johne's test. Tests include the ELISA and fecal cultures. Test status levels are as follows: Level 1 after the herd tests negative; Level 2

after the herd tests negative a second time; and so on up to Level 6. Whole herd tests under the Ohio program are free to the cattle industry and provided by the Ohio Department of Agriculture, Animal Disease Diagnostic Laboratory.

The Wisconsin Johne's Program differs slightly from the programs in Illinois and Ohio. The Wisconsin program offers either whole herd tests annually or split herd tests with the entire herd tested every year. Herds are given preventative management levels based upon the percent of cattle that test positive for Johne's Disease. Under Level A no animals tested positive, Level B less than 5.0% test positive, Level C less than 15.0% tested positive, and Level D more than 15.0% test positive. Those herds that are not tested are not assigned a preventive management level and are considered at maximum risk of testing positive for Johne's Disease. Like the Illinois' herd testing program, herd testing is not paid by the State of Wisconsin.

The general goals of Johne's herd testing programs are to identify herds without Johne's Disease and to reduce the number of herds with Johne's infected cattle. Cattle buyers have more confidence in purchasing cattle from herds which have tested negative for Johne's, giving an incentive to herd owners to use better management practices to control and reduce the number of cattle in their herds with Johne's Disease.

Currently the State of Iowa does not have a herd testing program for Johne's Disease.

ALTERNATIVES

There are three alternatives the State of Iowa could consider for management and control of Johne's Disease in cattle herds in the State. First, the State could continue without a program. The other two alternatives would be to have the State develop a Johne's Disease herd testing program with or without ELISA tests paid by the State.

BUDGET IMPACT

If the State continues without a Johne's Disease Program there would be no cost to the State. There would be economic losses, in the form of decreased milk production, lower weight cattle, and cattle sales to surrounding states with Johne's Programs, to the estimated 3,300 dairy producers and 27,500 cattle producers in the State.

Dr. John Schiltz, State Veterinarian, Department of Agriculture and Land Stewardship, has estimated the cost of a Johne's herd testing program similar to the one established in Wisconsin would be approximately \$1.2 million. The cost of this program is based on 40.0% of the 3,300 dairy producers (40 cows per herd tested) and 20.0% of the 27,500 cattle producers (30 cows per herd tested) in the State participating in the Program. Other costs would include \$150,000 for staff, office equipment, and administrative expenses.

If the State developed a Johne's herd testing program like the one in Wisconsin without the ELISA test paid by the State, the cost of the program would be approximately \$150,000 for staff, office equipment, and administrative expenses.

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